AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A microchannel mixing device for electrohydrodynamic mixing of fluids, comprising:

a microscale mixing channel, said mixing channel having an inlet for receiving at least one fluid;

at least one supply channel fluidicly connected to said mixing channel inlet for transport of said fluid into said mixing channel inlet, and

at least two electrodes ~~for imposing an electric field in said mixing channel~~, said electrodes having different geometries, wherein at least one of said electrodes ~~adapted for~~ is disposed in said mixing channel ~~charging at least a portion of said fluid~~.

2. (Previously presented) The mixing device of claim 1, wherein said at least one supply channel comprises a first supply channel for a first fluid and a second supply channel for a second fluid.

3. (Previously presented) The mixing device of claim 2, wherein at least one of said electrodes is disposed within said first or second supply channels.

4. (Currently amended) The mixing device of claim 1, further comprising structure for isolating ~~wherein at least~~ one of said electrodes ~~is a fluid isolated electrode disposed in a location which is not in contact with~~ from said fluid.

5. (Previously presented) The mixing device of claim 1, wherein said mixing device further comprises a cover plate in contact with a substrate.

6. (Currently amended) The mixing device of claim 5, wherein said mixing channel and supply channel are formed in said ~~cover plate~~ substrate.

7. (Previously presented) The mixing device of claim 5, wherein said cover plate is gas permeable.

8. (Previously presented) The mixing device of claim 5, wherein said substrate comprises silica or glass.

9. (Previously presented) The mixing device of claim 1, further comprising at least one power supply for applying a DC, pulsed DC or AC voltage to any of said electrodes.

10. (Currently amended) The mixing device of claim 9, wherein said power supply comprises at least two independent ~~power supply channels~~ voltage sources.

11. (Previously presented) The mixing device of claim 2, wherein said first and second fluids are mixed in said mixing channel, wherein at least one product is formed from a reaction.

12. (Previously presented) The mixing device of claim 1, wherein said electrodes are positioned along a length of said mixing channel, wherein a potential difference applied between said electrodes produces an electric field oriented substantially parallel or anti-parallel to a direction of flow of said fluid in said mixing channel.

13. (Previously presented) The mixing device of claim 1, wherein said electrodes are positioned transverse to a length of said mixing channel, wherein a potential difference applied between said electrodes produces an electric field oriented substantially transverse to a direction of flow of said fluid in said mixing channel.

14. (Withdrawn) A method for electrohydrodynamically mixing fluids, comprising the steps of:

delivering at least one fluid into a mixing channel;

inducing a charge on at least a portion of said fluid; and

applying an electric field across at least a portion of said mixing channel, wherein at least one of said fluid is mixed.

15. (Withdrawn) The method of claim 14, wherein said electric field originates or terminates outside said mixing channel.

16. (Withdrawn) The method of claim 14, further comprising the step of releasing gas evolved from said applying step.

17. (Withdrawn) The method of claim 16, wherein said releasing step comprises diffusion across a gas permeable layer.

18. (Withdrawn) The method of claim 14, wherein said applying step comprises application of a DC voltage.

19. (Withdrawn) The method of claim 14, wherein said applying step comprises application of a time varying voltage signal.

20. (Withdrawn) The method of claim 19, wherein said time varying voltage signal comprises a pulsed DC signal.

21. (Withdrawn) The method of claim 14, wherein said applying step comprises applying voltage using at least two independent power supply channels.

22. (Withdrawn) The method of claim 14, wherein said electric field applied is substantially parallel or anti-parallel to a direction of flow of said fluid in said mixing channel.

23. (Withdrawn) The method of claim 14, wherein said electric field applied is oriented substantially transverse to a direction of flow of said fluid in said mixing channel.

24. (New) The mixing device of claim 1, wherein a spacing distance between said electrodes is less than 450 μm.

25. (New) The mixing device of claim 1, wherein a spacing distance between said electrodes is less than 100 μm.

26. (New) The mixing device of claim 1, wherein a spacing distance between said electrodes is less than 25 μm.

27. (New) The mixing device of claim 1, further comprising structure to propel said

fluid through said device.

28. (New) The mixing device of claim 27, wherein said structure to propel said fluid comprises a pressure source, said pressure source applying a pressure differential across said mixing channel.

29. (New) The mixing device of claim 27, wherein said structure comprises electrodes disposed at an entrance of said inlet and an outlet of said mixing channel.

30. (New) The mixing device of claim 1, wherein said electrodes have different surface areas.

31. (New) The mixing device of claim 1, wherein two of said electrodes are disposed in said mixing channel.

32. (New) The mixing device of claim 1, wherein said two independent voltage sources provide opposite polarities.